FIG. 1

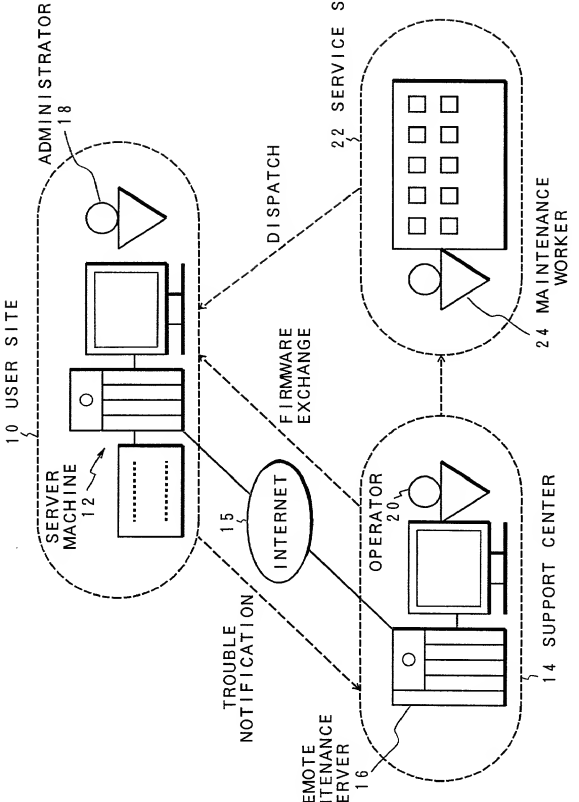

10 USER SITE
ADMINISTRATOR
18
SERVER MACHINE
12
15
INTERNET
TROUBLE NOTIFICATION
REMOTE MAINTENANCE SERVER
16
FIRMWARE EXCHANGE
DISPATCH
22 SERVICE SHOP
24 MAINTENANCE WORKER
OPERATOR
20
14 SUPPORT CENTER

FIG. 2A

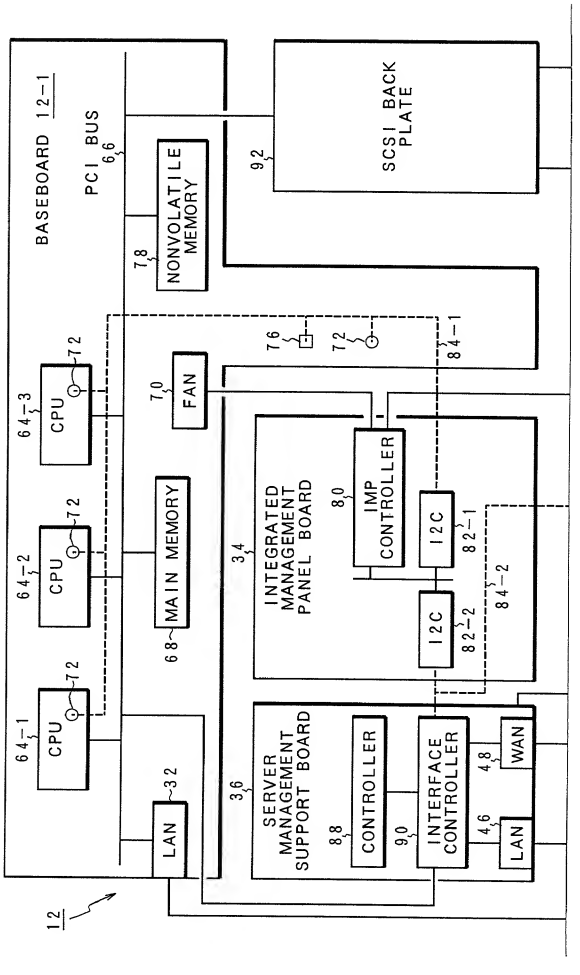

12
BASEBOARD 12-1
PCI BUS 66
64-1
CPU
72
64-2
CPU
72
64-3
CPU
72
MAIN MEMORY
68
FAN
70
NONVOLATILE MEMORY
78
SCSI BACK PLATE
92
INTEGRATED MANAGEMENT PANEL BOARD
34
IMP CONTROLLER
80
I2C
82-1
I2C
82-2
84-2
76
72
84-1
SERVER MANAGEMENT SUPPORT BOARD
36
CONTROLLER
88
90
INTERFACE CONTROLLER
LAN
32
LAN
46
WAN
48

FIG. 2B

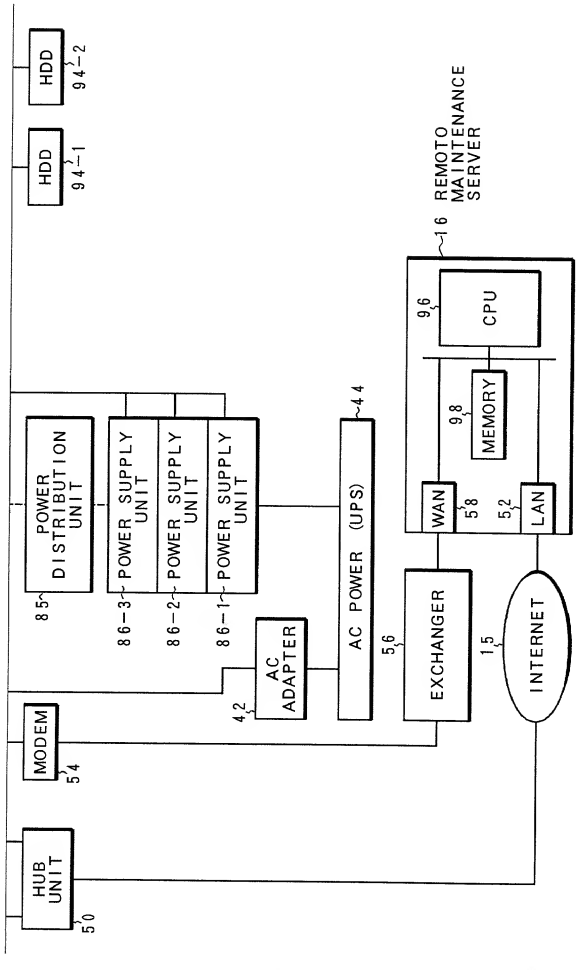

HUB UNIT
50
MODEM
54
POWER DISTRIBUTION UNIT
85
HDD
94-1
HDD
94-2
POWER SUPPLY UNIT
86-3
POWER SUPPLY UNIT
86-2
POWER SUPPLY UNIT
86-1
AC ADAPTER
42
AC POWER (UPS)
44
56
EXCHANGER
15
INTERNET
WAN
58
LAN
52
MEMORY
98
CPU
96
REMOTO MAINTENANCE SERVER
16

FIG. 3A

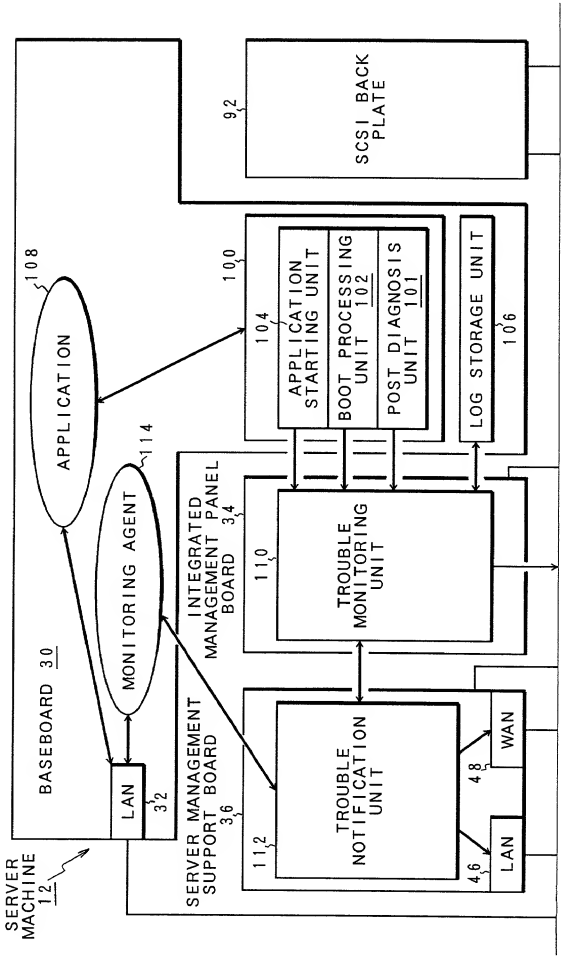

SERVER MACHINE 12
BASEBOARD 30
APPLICATION 108
MONITORING AGENT 114
LAN 32
SERVER MANAGEMENT SUPPORT BOARD 36
INTEGRATED MANAGEMENT PANEL BOARD 34
100
104
APPLICATION STARTING UNIT
BOOT PROCESSING UNIT 102
POST DIAGNOSIS UNIT 101
LOG STORAGE UNIT 106
110
TROUBLE MONITORING UNIT
112
TROUBLE NOTIFICATION UNIT
46
LAN
48
WAN
92
SCSI BACK PLATE

FIG. 3B

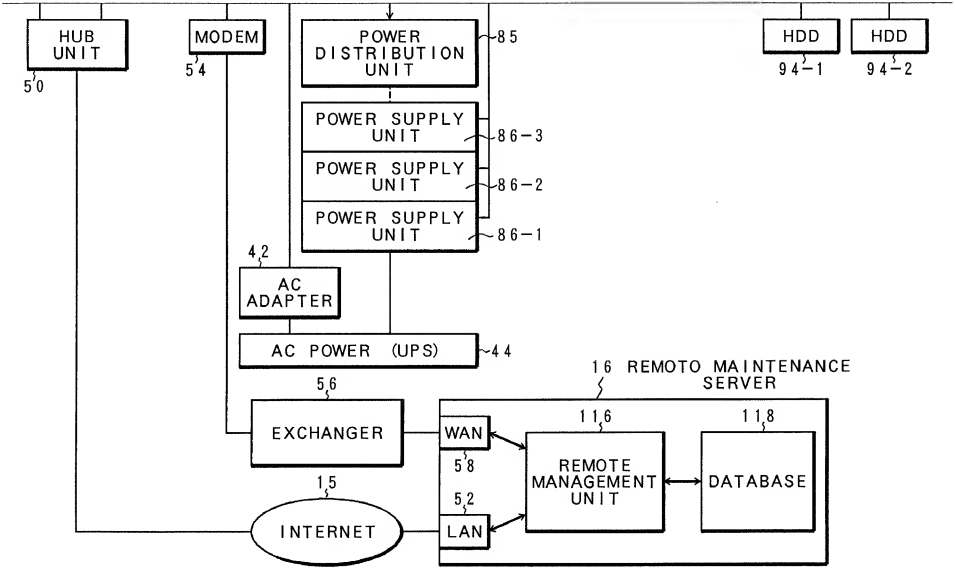

HUB UNIT
50
MODEM
54
POWER DISTRIBUTION UNIT
85
HDD
94-1
HDD
94-2
POWER SUPPLY UNIT
86-3
POWER SUPPLY UNIT
86-2
POWER SUPPLY UNIT
86-1
42
AC ADAPTER
AC POWER (UPS)
44
16 REMOTO MAINTENANCE SERVER
56
EXCHANGER
WAN
58
116
REMOTE MANAGEMENT UNIT
118
DATABASE
15
INTERNET
52
LAN

FIG. 4A

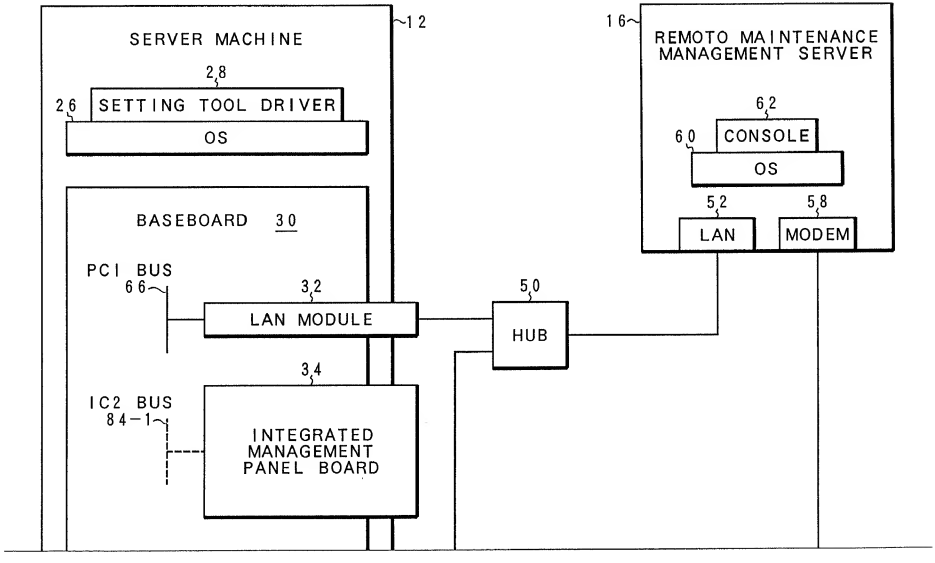

SERVER MACHINE
12
28
26
SETTING TOOL DRIVER
OS
BASEBOARD 30
PCI BUS
66
32
LAN MODULE
34
IC2 BUS
84-1
INTEGRATED MANAGEMENT PANEL BOARD
50
HUB
16
REMOTO MAINTENANCE MANAGEMENT SERVER
62
60
CONSOLE
OS
52
LAN
58
MODEM

FIG. 4B

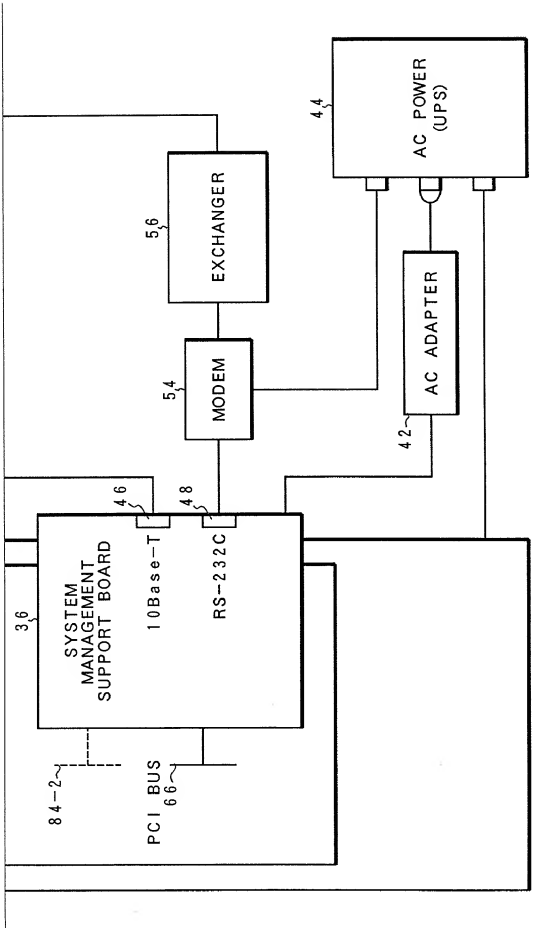

AC POWER (UPS)
44
EXCHANGER
56
MODEM
54
AC ADAPTER
42
SYSTEM MANAGEMENT SUPPORT BOARD
36
10Base-T
46
RS-232C
48
PCI BUS 66
84-2

FIG. 5A

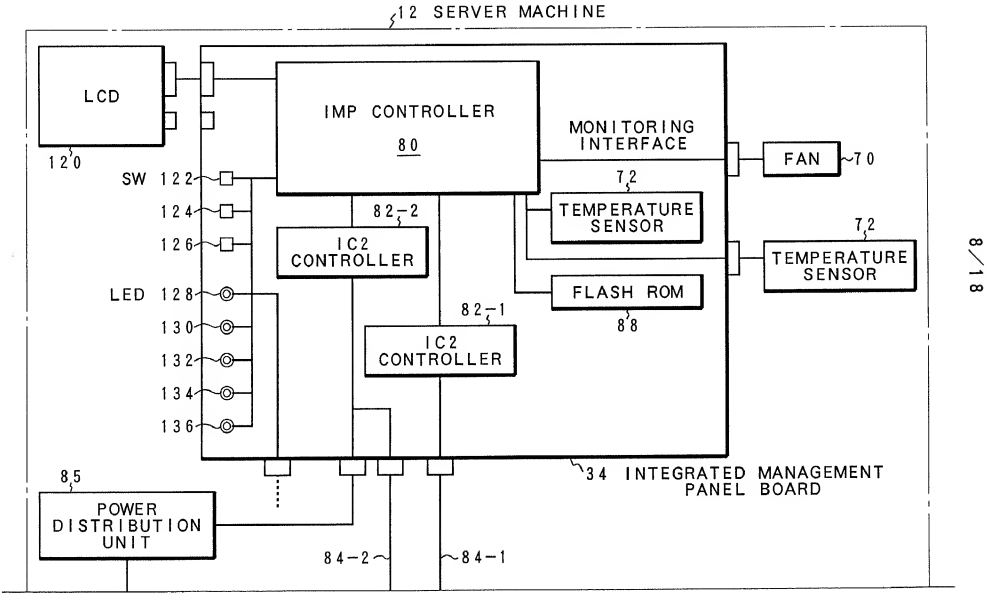

12 SERVER MACHINE
LCD
120
IMP CONTROLLER
80
MONITORING INTERFACE
FAN
70
72
TEMPERATURE SENSOR
72
TEMPERATURE SENSOR
SW 122
124
126
82-2
IC2 CONTROLLER
LED 128
130
132
134
136
82-1
IC2 CONTROLLER
FLASH ROM
88
34 INTEGRATED MANAGEMENT PANEL BOARD
85
POWER DISTRIBUTION UNIT
84-2
84-1

FIG. 5B

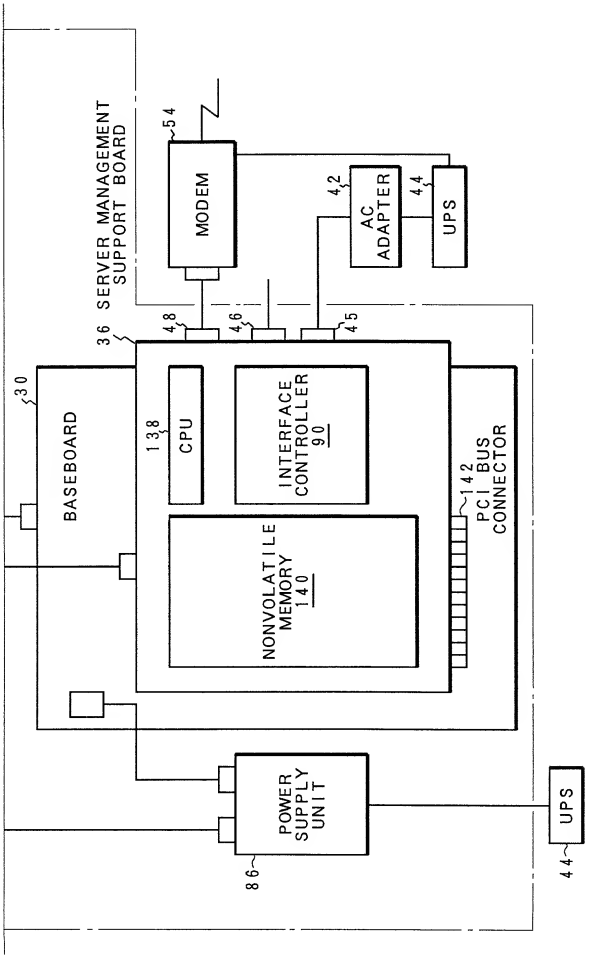

SERVER MANAGEMENT SUPPORT BOARD
36
BASEBOARD
30
CPU
138
INTERFACE CONTROLLER 90
NONVOLATILE MEMORY 140
PCI BUS CONNECTOR
142
48
46
45
MODEM
54
AC ADAPTER
42
UPS
44
POWER SUPPLY UNIT
86
UPS
44

FIG. 6A

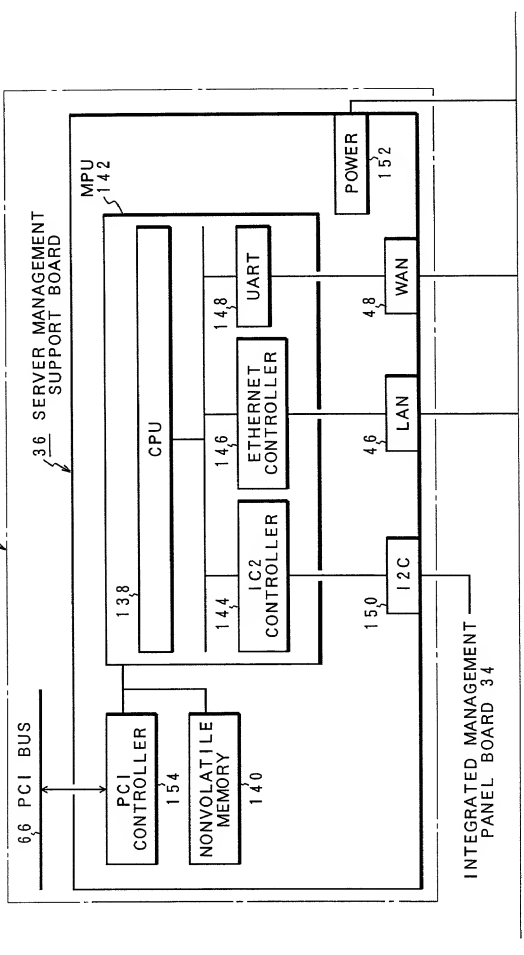

30 BASEBOARD
36 SERVER MANAGEMENT SUPPORT BOARD
MPU 142
CPU
13,8
14,4 I2C CONTROLLER
14,6 ETHERNET CONTROLLER
14,8 UART
15,0 I2C
46 LAN
48 WAN
POWER 152
66 PCI BUS
PCI CONTROLLER 154
NONVOLATILE MEMORY 140
INTEGRATED MANAGEMENT PANEL BOARD 34

FIG. 6B

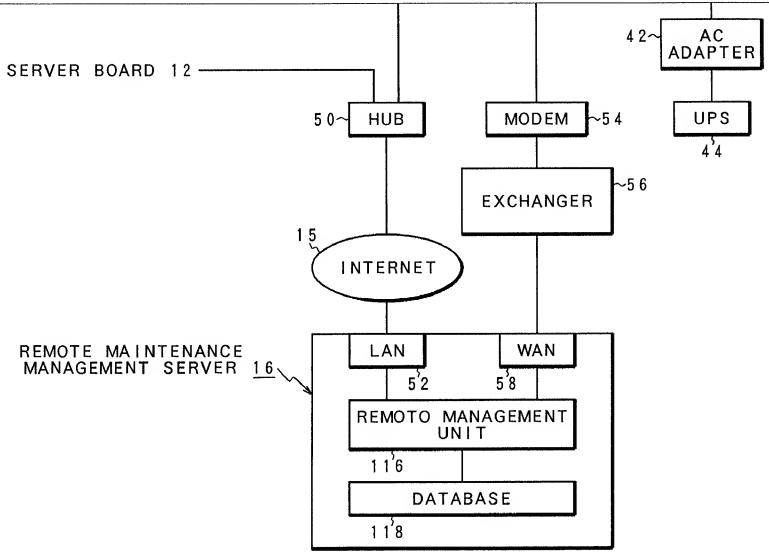

SERVER BOARD 12
50
HUB
MODEM
54
42
AC ADAPTER
UPS
44
EXCHANGER
56
15
INTERNET
REMOTE MAINTENANCE MANAGEMENT SERVER 16
LAN
52
WAN
58
REMOTO MANAGEMENT UNIT
116
DATABASE
118

FIG. 7A

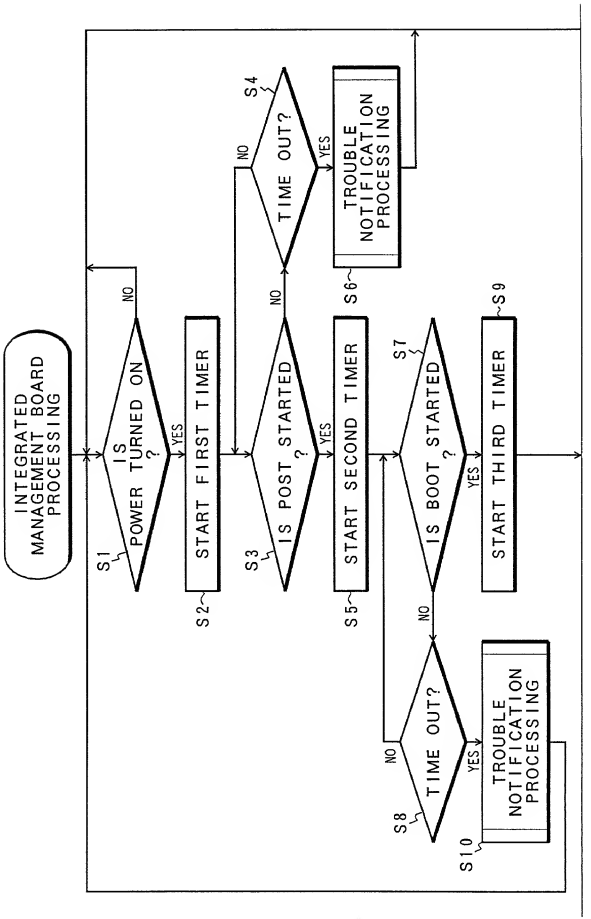

INTEGRATED MANAGEMENT BOARD PROCESSING
S1
IS POWER TURNED ON ?
NO
YES
S2
START FIRST TIMER
S3
IS POST STARTED ?
NO
YES
S4
TIME OUT?
NO
YES
S6
TROUBLE NOTIFICATION PROCESSING
S5
START SECOND TIMER
S7
IS BOOT STARTED ?
NO
YES
S8
TIME OUT?
NO
YES
S10
TROUBLE NOTIFICATION PROCESSING
S9
START THIRD TIMER

FIG. 7B

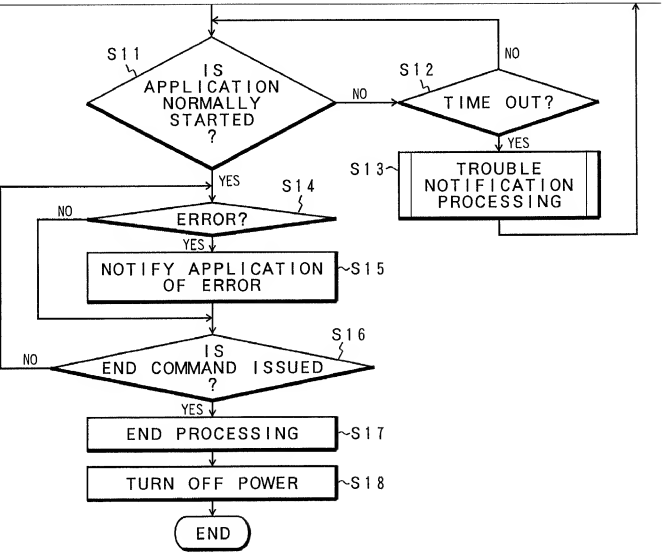

S11
IS APPLICATION NORMALLY STARTED ?
NO
S12
TIME OUT?
NO
YES
S13
TROUBLE NOTIFICATION PROCESSING
YES
S14
ERROR?
NO
YES
NOTIFY APPLICATION OF ERROR
S15
S16
IS END COMMAND ISSUED ?
NO
YES
END PROCESSING
S17
TURN OFF POWER
S18
END

FIG. 8

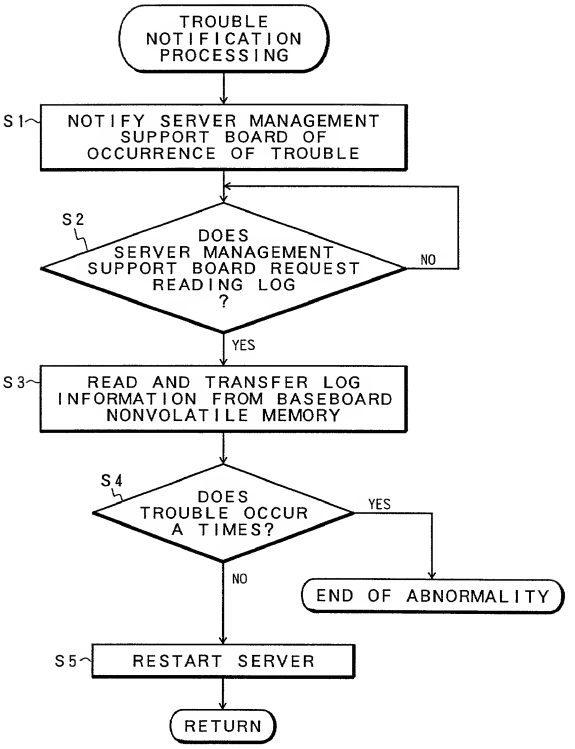

TROUBLE NOTIFICATION PROCESSING
S1
NOTIFY SERVER MANAGEMENT SUPPORT BOARD OF OCCURRENCE OF TROUBLE
S2
DOES SERVER MANAGEMENT SUPPORT BOARD REQUEST READING LOG ?
NO
YES
S3
READ AND TRANSFER LOG INFORMATION FROM BASEBOARD NONVOLATILE MEMORY
S4
DOES TROUBLE OCCUR A TIMES?
YES
NO
END OF ABNORMALITY
S5
RESTART SERVER
RETURN

FIG. 9

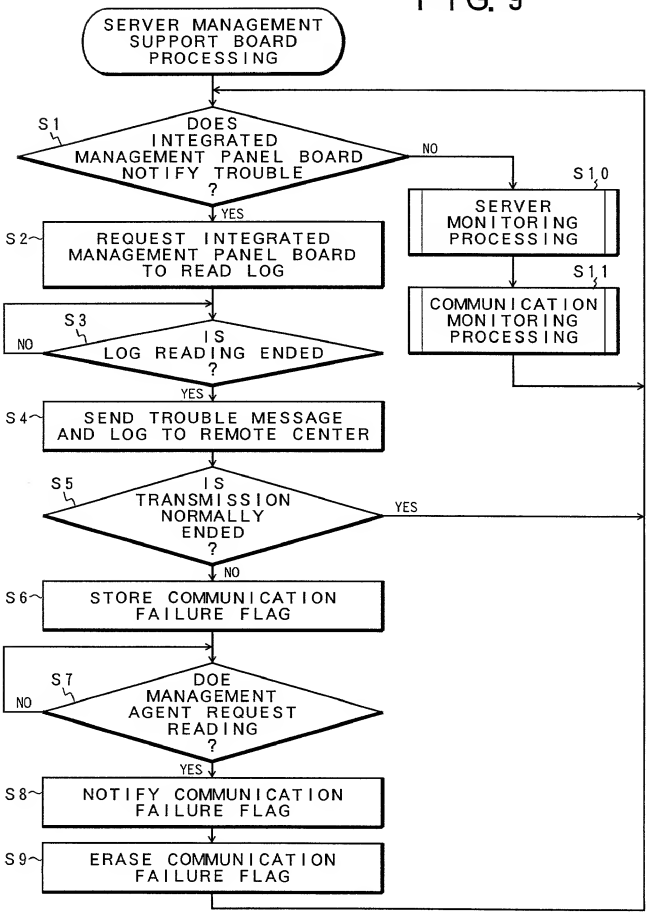

SERVER MANAGEMENT SUPPORT BOARD PROCESSING
S1
DOES INTEGRATED MANAGEMENT PANEL BOARD NOTIFY TROUBLE ?
NO
YES
S10
SERVER MONITORING PROCESSING
S11
COMMUNICATION MONITORING PROCESSING
S2
REQUEST INTEGRATED MANAGEMENT PANEL BOARD TO READ LOG
S3
IS LOG READING ENDED ?
NO
YES
S4
SEND TROUBLE MESSAGE AND LOG TO REMOTE CENTER
S5
IS TRANSMISSION NORMALLY ENDED ?
YES
NO
S6
STORE COMMUNICATION FAILURE FLAG
S7
DOE MANAGEMENT AGENT REQUEST READING ?
NO
YES
S8
NOTIFY COMMUNICATION FAILURE FLAG
S9
ERASE COMMUNICATION FAILURE FLAG

FIG. 10

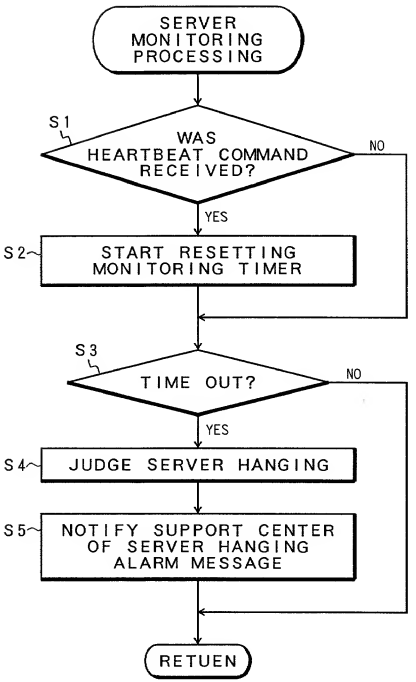

SERVER MONITORING PROCESSING
S1
WAS HEARTBEAT COMMAND RECEIVED?
NO
YES
S2
START RESETTING MONITORING TIMER
S3
TIME OUT?
NO
YES
S4
JUDGE SERVER HANGING
S5
NOTIFY SUPPORT CENTER OF SERVER HANGING ALARM MESSAGE
RETUEN

FIG. 11

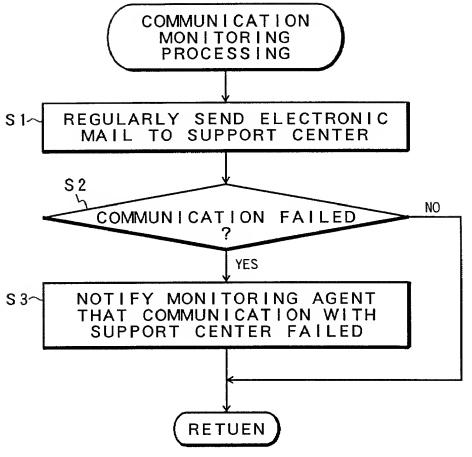
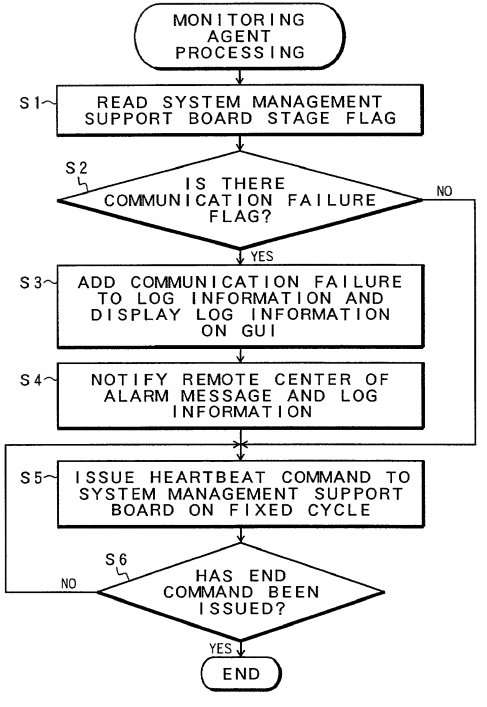

COMMUNICATION MONITORING PROCESSING
S1
REGULARLY SEND ELECTRONIC MAIL TO SUPPORT CENTER
S2
COMMUNICATION FAILED ?
NO
YES
S3
NOTIFY MONITORING AGENT THAT COMMUNICATION WITH SUPPORT CENTER FAILED
RETUEN

FIG. 12


MONITORING AGENT PROCESSING
S1
READ SYSTEM MANAGEMENT SUPPORT BOARD STAGE FLAG
S2
IS THERE COMMUNICATION FAILURE FLAG?
NO
YES
S3
ADD COMMUNICATION FAILURE TO LOG INFORMATION AND DISPLAY LOG INFORMATION ON GUI
S4
NOTIFY REMOTE CENTER OF ALARM MESSAGE AND LOG INFORMATION
S5
ISSUE HEARTBEAT COMMAND TO SYSTEM MANAGEMENT SUPPORT BOARD ON FIXED CYCLE
S6
HAS END COMMAND BEEN ISSUED?
NO
YES
END